

**WHAT IS CLAIMED:**

1. A method for producing a transgenic non-human animal, comprising:
  - introducing a cell comprising a satellite artificial chromosome into a female non-human animal, wherein the cell develops into an embryo in a female non-human animal; and
  - allowing the embryo to develop into a transgenic non-human animal comprising a satellite artificial chromosome.
2. The method of claim 1, wherein the satellite artificial chromosome comprises heterologous DNA that encodes a therapeutic product.
3. The method of claim 1, wherein the cell contains the satellite artificial chromosome in a pronucleus.
4. The method of claim 1, wherein the cell is a zygote.
5. The method of claim 1, wherein the cell is a fertilized ovum.
6. The method of claim 1, wherein the cell is an ovum that develops into an embryo or zygote.
7. The method of claim 1, wherein the cell is a bird, mouse, reptile, amphibian, insect or fish cell.
8. A method of producing a transgenic non-human animal embryo, comprising:
  - introducing a satellite artificial chromosome into a cell, wherein the cell develops in culture into a non-human animal embryo; and
  - culturing the cell under conditions whereby it develops into an embryo.
9. The method of claim 8, wherein the cell comprises a fertilized oocyte, an ovum, a fertilized ovum or a zygote.
10. The method of claim 8, wherein the cell is a bird, mouse, reptile, amphibian, insect, or fish cell.

11. The method of claim 1, wherein the satellite artificial chromosome is isolated prior to introduction into the cell.

12. The method of claim 1, wherein the satellite artificial chromosome is introduced into the cell by a method selected from the

5 group consisting of direct uptake, incubation with polyethylene glycol (PEG), lipofection, microinjection, cell fusion, microcell fusion, electroporation, electrofusion, particle bombardment, projectile bombardment, calcium phosphate precipitation and site-specific targeting.

13. The method of claim 1, wherein the embryo and the female  
10 non-human animal are of the same species.

14. A method for producing a transgenic non-human animal, comprising:

introducing an embryo comprising a satellite artificial chromosome into a female non-human animal; and

15. allowing the embryo to develop into a transgenic non-human animal comprising a satellite artificial chromosome.

16. The method of claim 14, wherein:

the embryo is produced by introducing a satellite artificial chromosome into a cell that develops into an embryo; and

20. introduction is effected by a method selected from the group consisting of direct uptake, incubation with polyethylene glycol (PEG), lipofection, microinjection, cell fusion, microcell fusion, electroporation, electrofusion, particle bombardment, projectile bombardment, calcium phosphate precipitation and site-specific targeting.

25. 16. The method of claim 15, wherein the cell is selected from the group consisting of a bird, insect or fish cell.

17. The method of claim 15, wherein the embryo and the female non-human animal are of the same species.

18. A method for producing a transgenic non-human animal,  
30 comprising:

introducing a fertilized oocyte comprising a satellite artificial chromosome into a female non-human animal; and  
allowing the resulting embryo to develop into a transgenic non-human animal comprising a satellite artificial chromosome.

5 19. A method for producing a transgenic animal, comprising:  
introducing an embryonic stem cell comprising a satellite artificial chromosome into an embryo;  
introducing the embryo into a female mouse; and  
allowing the embryo to develop into a transgenic animal comprising

10 a satellite artificial chromosome.

20. The method of claim 19, wherein the animal is a bird.

21. A method for producing a transgenic non-human animal, comprising:  
introducing an ovum comprising a satellite artificial chromosome

15 (SATAc) into a female non-human animal, wherein the ovum develops into a zygote or embryo; and  
allowing the embryo or zygote to develop into a transgenic non-human animal comprising the SATAc.

22. The method of claim 21, wherein the satellite artificial

20 chromosome is a megachromosome derived from a cell line having all of the identifying characteristics of the cell line deposited under ECACC accession number 96040928 or 96040929.